NNRTI-associated mutations in patients with virologic failure on first-line regimen in Yekaterinburg

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**Background:** Since 2006 antiretroviral therapy is widely available in most regions of Russia. According to Russian national HIV/AIDS clinical guidelines combination of zidovudine, lamivudine and efavirenz (AZT/3TC+EFV respectively) is the only preferred regimen for antiretroviral-naive adults and in case of resistance, EFV could be changed to etravirine. Some patients demonstrate virologic failure on first-line regimen. In the majority of these cases virologic failure appears after undetectable viral load has been achieved.

**Methods & Materials:** We investigated spectrum and prevalence of certain NNRTI-associated mutations in patients with virologic failure on the first-line combination of AZT/3TC+EFV in Yekaterinburg, Russia. A total of 60 Russian subjects who have developed virologic failure after one year of successful ARV therapy (with undetectable viral load) consisting of AZT/3TC+EFV were enrolled in this cross-sectional study based on data obtained from July 2011 to December 2012. HIV-1 genotypes from these patients were analysed for NNRTI mutations.

**Results:** All patients have shown NNRTI-associated mutations. 65% of patients developed only one mutation - K103N which is associated with resistance to efavirenz. 35% of patients developed etravirine-associated mutations: 5% of patients developed 3 NNRTI-associated mutations: Y181C + G190S + K101E, which corresponds to the highest level of resistance to etravirine. 20% of patients developed either single Y181C (5 patients), or G190S+K101E (6 patients), or single mutation Y181 (1 patient), or single L100I (1 patient), which means possible resistance to etravirine. We have also identified single G190S in 2 patients, single K101E in 2 patients, single A98G in one patient, and single V179D in one patient.

**Conclusion:** Our results have shown that in patients with virologic failure on AZT/3TC+EFV, K103N (which makes further use of efavirenz impossible) is the most common mutation. Also in 35% of cases, etravirine-associated mutations have been found. It means that in some patients further treatment with NNRTI is impossible. Thus genotyping should be performed in all patients with virologic failure on first-line regimen in Russia to guide future selection of antiretroviral regimens.

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HIV–malaria coinfection: Anti-malaria therapy in people living with HIV/AIDS in Owerri, Nigeria

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**Background:** Studies show that HIV and malaria infections fuel each other. The need to identify the most effective anti-malaria drug for PLWHA in malaria endemic communities was the main focus for this study.

**Methods & Materials:** This was a hospital based study using the Heart to Heart clinic of the Imo Specialist Hospital as the study site. Ethical clearance was obtained from all relevant authorities. Study participants were both HIV+ and HIV− volunteers. Study volunteers were placed in six respective groups of different commonly available anti-malaria combination therapies thus: Coartem (Artemether + Lumefantrine), Blofast (Artesunate +Mefloquin), Waipa (Dihydroartemisin + Piperequinie Phosphate), Winthrop (Artesunate + Amodiaquine), Maltarka (Artesunate + Suladoxine + Pyrimethamine) and non ACT Laridox (Sulfadoxine + Pyrimethamine). Malaria parasitemia, CD4 cells count, Haematological parameters (haemoglobin level, packed cell volume, total white blood cells count, neutrophils and lymphocyte cells count as well as erythrocyte sedimentation rate [ESR]) were assessed using routine techniques pre and 2 weeks post treatment with respective anti-malaria therapy from 5mls venous blood taken from each volunteer.

**Results:** The study population was 473 volunteers made up of HIV+ and HIV−. Coartem in PLWHA reduced the malaria parasitemia significantly, increased the CD4 cell counts, with a marked reduction of ESR. Blofast treatment in PLWHA resulted in increased malaria parasitemia, decreased CD4 cells, increased lymphocytes and ESR, as well as decreased neutrophils. Waipa treatment in PLWHA resulted in a decreased malaria parasitemia, decreased CD4 cells, increased neutrophils and ESR as well as decreased lymphocytes. Winthrop in PLWHA showed only a very slight decrease in malaria parasitemia, decreased CD4 cells, a marked reduction in both ESR and lymphocytes cells as well as a sharp increase in the neutrophils. Maltarka in PLWHA decreased malaria parasitemia, with a marked increase in CD4 cells, increased neutrophils and ESR, and decreased lymphocytes cell count. Laridox in PLWHA, increased malaria parasitemia, decreased CD4 cells, exhibited reduction in both ESR and lymphocytes cell count with a sharp increase in the neutrophils.

**Conclusion:** Findings from this study indicate that Coartem (Artemether + Lumefantrin) appears to be most effective ACT for PLWHA. Other implications are discussed.